

apparatus; but on closer examination about half a dozen delicate dark (Fraunhofer) lines were made out by Dr. Halm, extending from a little below D to about F. The spectrum of the Nova, at its present stage, is therefore of a distinct but feebly developed solar type. The existence of these lines I was able to confirm, but the sky became gradually obscured before their positions could be satisfactorily determined.

At about the same hour a photograph of the Nova was secured by Mr. Heath at a time when all the neighbouring stars were obscured by haze. Except a very short interval on the 23rd, the sky here has been completely overcast since the 22nd.

The Nova was independently discovered by Mr. J. E. Gore at Dublin at 11h. 15m. Dublin time on the 22nd, and by Mr. W. B. Dodd and Mr. H. Wake, of Whitehaven, on the 23rd inst.

RALPH COPELAND.

Royal Observatory, Edinburgh, February 25.

On the night of the 25th observations were made at the Solar Physics Observatory, South Kensington, the general results of which have been stated by Sir N. Lockyer as follows in a letter to the *Times*:—

(1) The spectrum strongly recalls that of Nova Aurigæ.

(2) There are at least two light sources involved; one with a dark-line spectrum, the other giving chiefly the bright lines of hydrogen, helium, asterium and calcium.

(3) Some of the bright lines are probably reversed.

(4) The broadening of the bright lines is considerably greater than that observed in Nova Aurigæ.

(5) It has been determined by a comparison spectrum of Bellatrix, on the same plate, that the middle of the bright lines occupies nearly the normal position in the spectrum; the greatest breadth of lines observed extends over some 30 tenth-metres.

(6) The centres of the bright and dark lines are separated by about 15 tenth-metres, showing a differential velocity of somewhere about 700 miles per second between the colliding light sources.

(7) The star is keeping up its magnitude so far as may be gathered from a very brief observation made between clouds on Friday. To-night (February 25) it has been brighter than Aldebaran, slightly less bright than Capella.

PHOSPHORESCENCE AS A SOURCE OF ILLUMINATION IN PHOTOGRAPHY.

IN certain libraries there exists a fixed rule that no books may be removed. This being so, all extracts and copies of plates and engravings have to be made in the libraries. Reproduction by the methods of ordinary photography is most inconvenient, since the employment of artificial light is strictly prohibited; also the introduction of a camera, and its manipulation in a library, are surrounded by many difficulties. These circumstances led me to devise the following method for obtaining copies of plates, engravings, printing and writing. A piece of cardboard is coated with a phosphorescent substance, and, after sufficient exposure to the light of the sun or of an arc lamp, it is placed at the back of the engraving or writing to be copied; on the face of the engraving or writing a dry photographic plate is placed, and then the book is closed for a certain time, depending on the nature and thickness of the paper used in the book. I find that the period of time lies between eighteen and sixty minutes. The plate is then withdrawn and stored in a dark box for development. The dry plate is easily manipulated under a cloth, which shuts off all light and covers the book during the operation. The results are sufficiently good for most purposes—in the case of some papers the fibrous structure is shown; this very slightly detracts from the clearness of the copies made by this process. Neither the luminous substance nor the dry plate injure

the book in any way, so that the method may be employed in the case of valuable prints and engravings (Fig. 1). If films be used instead of plates, a large number of copies of different engravings in the same book may be made at the same time. The time of exposure to the phosphorescent backing is shortened considerably by placing the phosphorescent card on a warm surface, such as that of a metal vessel heated to about 20° C. with hot water:



FIG. 1.

when films are employed, this temperature should not be exceeded. In an experiment made in the laboratory I found that the phosphorescent substance under normal barometric pressure became brightly luminous when subjected to the brush discharge of a Tesla inductor; the discharge from an ordinary induction coil fails to produce the same effects.

F. JERVIS-SMITH.

THE ROYAL SOCIETY'S ADDRESS TO THE KING.

ON Saturday last His Majesty the King received deputations with addresses from the Universities of Oxford and Cambridge, General Assembly of the Church of Scotland, the Corporation of the City of Liverpool, and the Royal Society.

The Royal Society was represented by Sir William Huggins, K.C.B. (president), Mr. A. B. Kempe, treasurer (mover), Sir Michael Foster, M.P., secretary (seconder), Dr. T. E. Thorpe, C.B. (foreign secretary), Lord Lister, Lord Kelvin and Sir J. D. Hooker (past presidents), and Mr. W. H. M. Christie, C.B., Astronomer Royal (vice-president). The following was their address:—

TO THE KING'S MOST EXCELLENT MAJESTY.

The Humble Address of the President, Council, and Fellows of the Royal Society for Promoting Natural Knowledge.

Most Gracious Sovereign,—We, your Majesty's most dutiful and loyal subjects the President, Council, and Fellows of the Royal Society of London for Promoting Natural Knowledge, humbly beg leave to offer our deepest and most heartfelt sympathy with your Majesty in the great sorrow which has befallen you in the death of your beloved mother, our late Sovereign Lady the Queen. Your Majesty's loss is our loss, a loss not only to ourselves, not only to all your Majesty's subjects throughout the Empire, but to the whole world. During your beloved mother's wise and beneficent reign under her thoughtful fostering care that natural knowledge which the society was founded to promote has been promoted to an extent and in ways never known before, and we feel sure that not in our time only, but in the years to come, to the story of the advance of science in the past century will be most closely linked the memory of the goodness, the wisdom, the peerless worth of the august and

beloved lady whose death has now plunged us into the deepest grief.

While thus uttering words of sorrow we ask leave, sire, at the same time, to lay at your Majesty's feet our unfeigned and heartfelt congratulation upon your Majesty's accession to the Throne of your ancestors to reign over a people to whom happily your Majesty is no stranger, but who have by many experiences learned to recognise your great worth, and have been led to the sure hope that under your gracious rule the nation will continue to hold the proud position which it has gained under the guidance of your beloved mother.

That your Majesty's reign may be long, happy, and glorious, and that you may ever rule in the hearts as well as over the persons of a loving, dutiful, and grateful people is the earnest wish and ardent prayer of your Majesty's loyal and dutiful subjects, the President, Council, and Fellows of the Royal Society of London.

The King's reply was as follows :—

I am much gratified by the warm expression of your loyalty and affection, of your profound sympathy with our present grief, and of your loving appreciation of the goodness and great qualities of my dearly beloved mother. I thank you for your dutiful good wishes, and I share your hope that my reign also may be blessed by a continuous growth of my people in enlightenment, refinement, and power for good. The intellectual attainments and energies which your society so conspicuously represents are among the most precious possessions of the nation as aids in securing those high ends, and I remember with gratification the close connection of the society with its Royal founder and my other predecessors on this Throne, and the fact that I am a Fellow, as was also my dear father. You may feel assured of my constant interest in and protection of your work, and in token of my good will I shall be pleased to inscribe my name as patron in the charter book.

NOTES.

WE deeply regret to announce that Prof. G. F. Fitzgerald, F.R.S., died on Thursday, February 21, at the age of forty-nine years.

SIR ARCHIBALD GEIKIE retires to-day, February 28, from the office of Director-General of the Geological Survey of the United Kingdom and Director of the Geological Museum, after a service of nearly forty-six years. He has remained at his post after the usual age-limit in order to complete the annual summary of progress of the institution under his charge. It is understood that, being now freed from administrative duties, he intends to devote himself to the completion of several important Memoirs of the Geological Survey. He is succeeded in his appointment by his colleague, Mr. J. J. H. Teall, F.R.S., who is at present president of the Geological Society.

A VERY interesting announcement referring to the Leonid meteors has been received from the president of the Toronto Astronomical Society. He informs us that Mr. R. F. Stupart, vice-president of the Society, director of the Toronto Observatory and superintendent of the Meteorological Service of Canada, has sent him a copy of the following notes made by an observer at York Factory, Hudson's Bay :—"November 15, 1900. Very general display of shooting stars. Some very big ones N.W. to S.E. Sky full in shoals. November 16.—Shooting stars seen until daylight. Scared the people—they thought it was the end of the world." From these records it appears that a shower of Leonid meteors actually did occur last November.

IT is announced that a strong and influential committee has been formed with a view of erecting a triple monument in Heidelberg, by which the names of Bunsen, Kirchhoff and Helmholtz, whose lives and works are inseparably associated with the scientific progress and the rapid social and intellectual development of the alma mater of that city, should be thus lastingly and fittingly commemorated. It is proposed that special appeals for contributions should shortly be issued to

some of the learned societies and academies in the German Empire as well as to some personal friends and admirers of the late three famous men of science, whose friendship they are known to have enjoyed and by whose influence they have benefited in their subsequent scientific attainments. It is understood, however, that the general public will not be invited to contribute towards this Bunsen-Kirchhoff-Helmholtz memorial fund. The chairman of the committee is Dr. Adolf Kussmaul, Emeritus Professor of Medicine in the University of Strassburg, to whose suggestion the movement owes its origin.

THE current issue of the *Journal* of the Franklin Institute contains an interesting account of a discussion on the electric distribution of power in workshops, which brings out very clearly the numerous advantages to be gained by the adoption of this method of distributing power. The rapid success which the system has achieved in America points conclusively to its convenience and economy. As one of the speakers pointed out, electric power originally based its claim to attention on the ground that there was much less loss in distribution, and that a saving of 20 to 60 per cent. of the total power used might therefore be effected by substituting electric for shaft driving. This saving, although at first sight it appears great, may, however, be quite small when considered in relation to the total cost of turning out the finished article which the factory produces, amounting, perhaps, to but a small fraction of a per cent. But electric power, it was soon found, effects saving in many other ways, one of the chief of which is that it enables the positions of machinery to be decided with reference to the machine rather than to the shafting. This means that the available floor space can be much more thoroughly utilised. It was stated in the discussion that in the case of the Baldwin Locomotive Works, the adoption of electric driving has saved so much floor space that the works would have to be made about half as big again to give the same output with shaft driving. In addition to these advantages, electric power has proved more convenient, healthier and less dangerous. With all these recommendations it ought not to be long before it entirely displaces the old-fashioned systems.

A BILL intended to organise the National Observatory of the United States has been introduced into the Senate by Mr. Morgan. The object is to convert the U. S. Naval Observatory into a National Observatory, and the following sections from the text of the bill, given in *Science*, describe the proposed organisation :—"That the Director of the National Observatory shall be an eminent astronomer, appointed by the President, by and with the advice and consent of the Senate, at a salary of five thousand dollars per annum, and shall be selected from the astronomers of the National Academy of Sciences unless, in the judgment of the President, an American astronomer of higher scientific and executive qualifications shall be found. That the Secretary of the Navy may detail for duty as astronomers at the National Observatory such professors of mathematics and other officers of the Navy as he shall deem necessary in the interests of the public service; but on and after the passage of this Act no appointments shall be made of such professors unless required for service at the Naval Academy."

THE departmental committee appointed by the Board of Agriculture, and presided over by the Earl of Onslow, to inquire into the conditions under which agricultural seeds are at present sold, has completed the report upon the subject. The committee conclude that the seed trade in England is, on the whole, well conducted, and has of late years improved with the advance of science. Nevertheless, the majority of the committee recommend that one central station should be provided in the United Kingdom for the purpose of testing the purity and germinating power of seeds sent to it for official examination.